

Figure 1A: MIMO OFDM modem

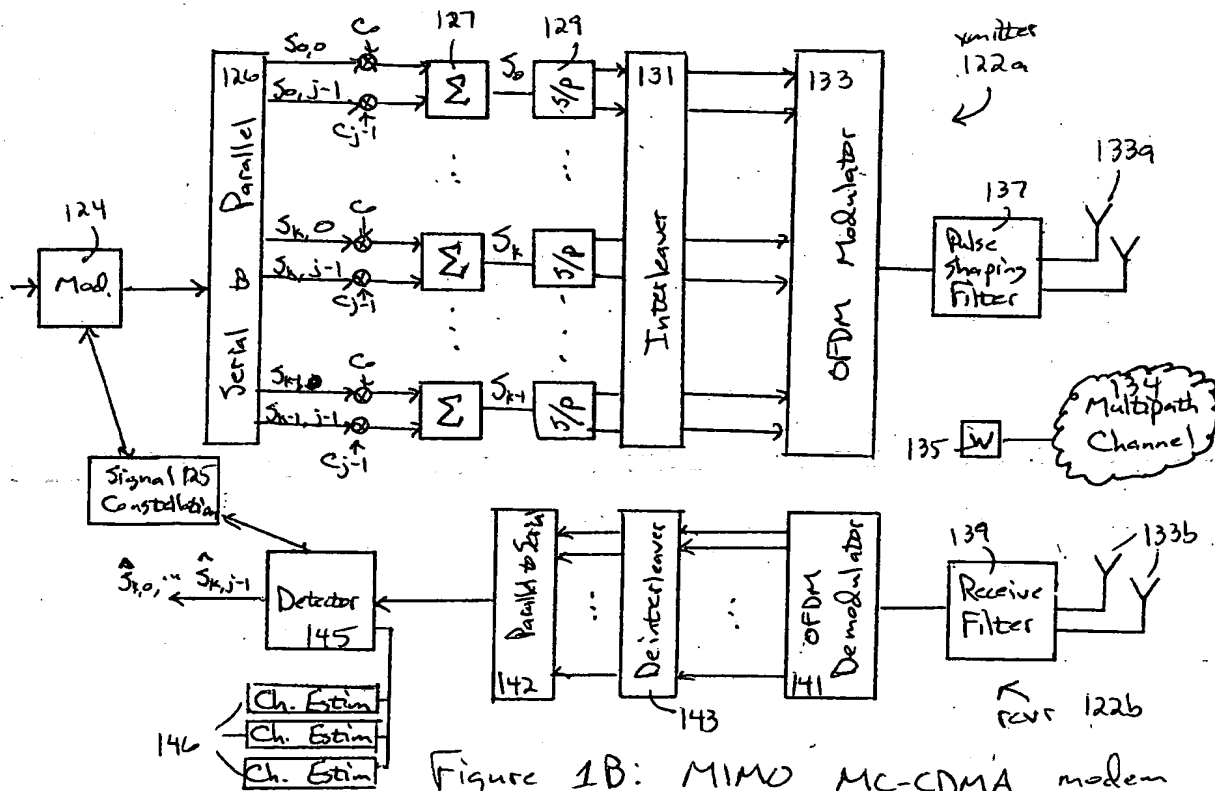


Figure 1B: MIMO MC-CDMA modem

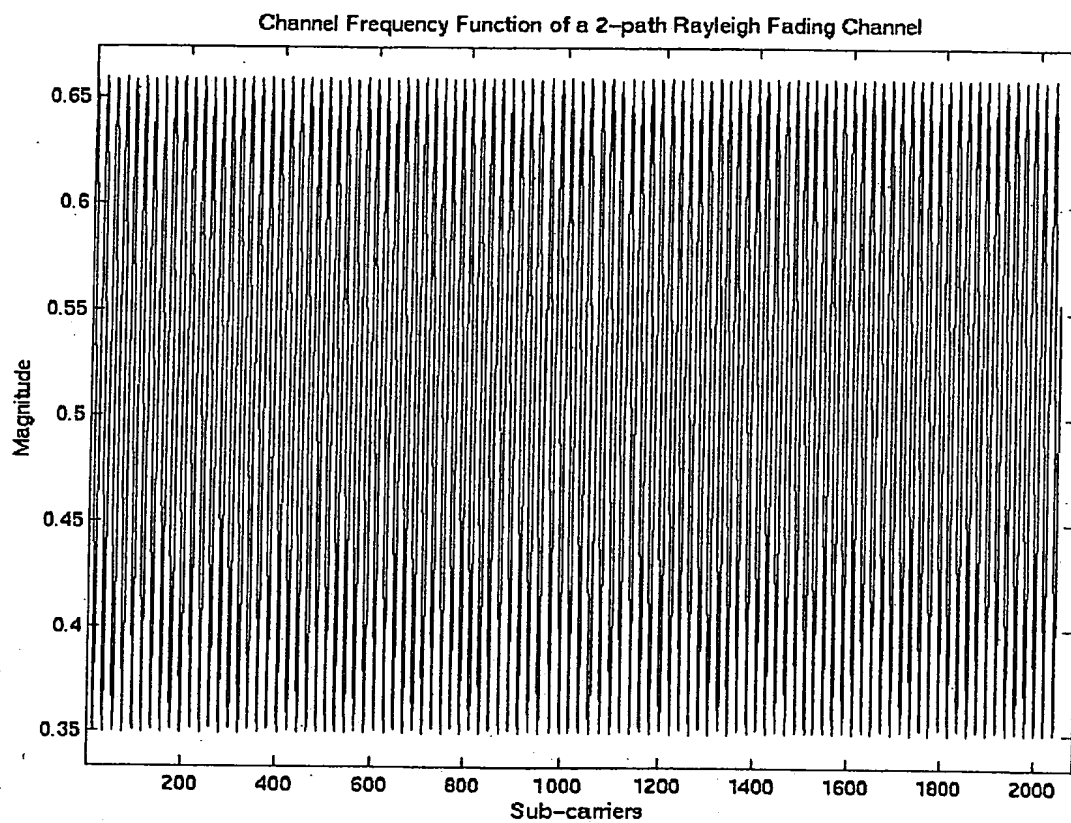


Figure 2 – Snapshot of the magnitude frequency function of a two-path Rayleigh fading channel: Prior Art

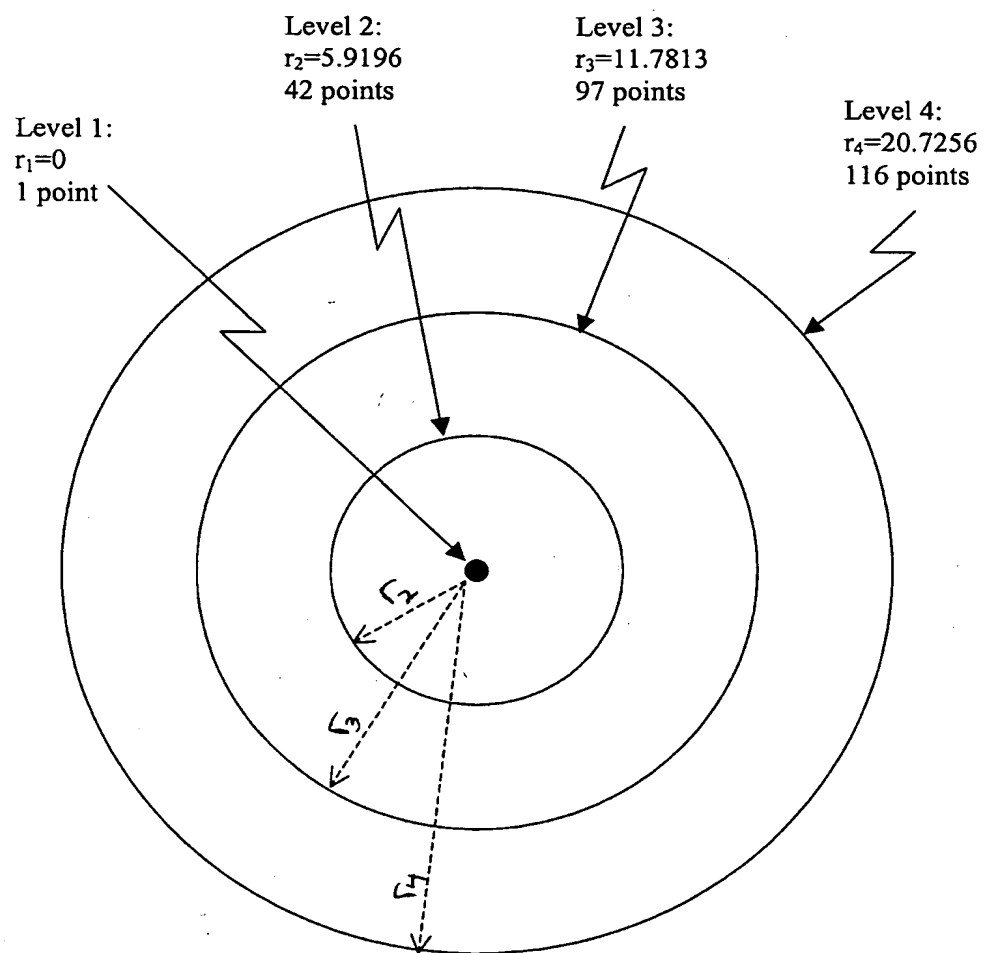


Figure 3: Four level, four-dimensional spherical constellation

2x2, 1 C, 128 SC, 16QAM, SF 4, 1 UpB, 8 Pilots, $P_{\text{pilot}} = 1.0$, OFI, No PSF, 4 SpC, 20 CP, Block Veh A, 5-tap LS

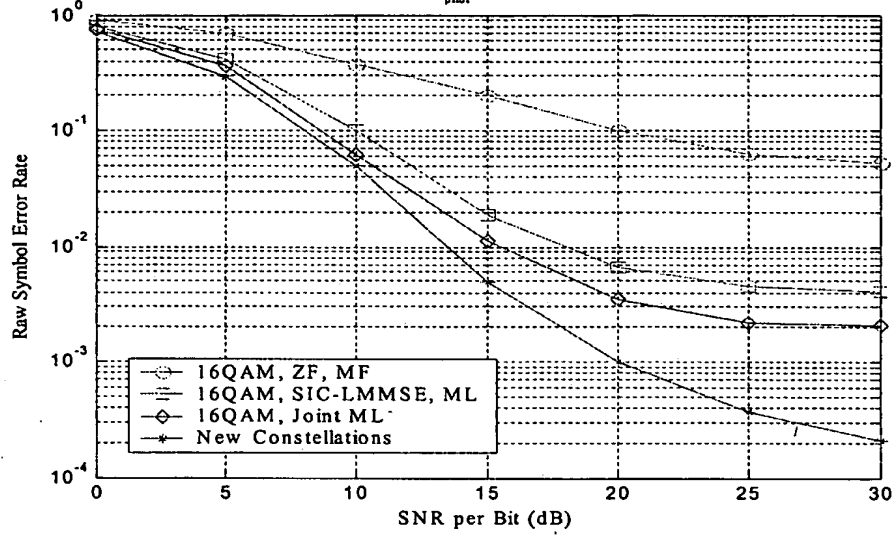


Figure 4A: Performance comparison between different conventional (BLAST-type) MIMO techniques and new constellations for a lightly loaded 2x2 MC-CDMA system with 128 sub-carriers, 8 pilots, and estimating 5 taps of the Block Vehicular A channel.

2x2, 1 C, 128 SC, 16QAM, SF 4, 1 UpB, 8 Pilots, $P_{\text{pilot}} = 1.0$, OFI, No PSF, 4 SpC, 20 CP, Veh A, 120.0 Km/h, 5-tap LS

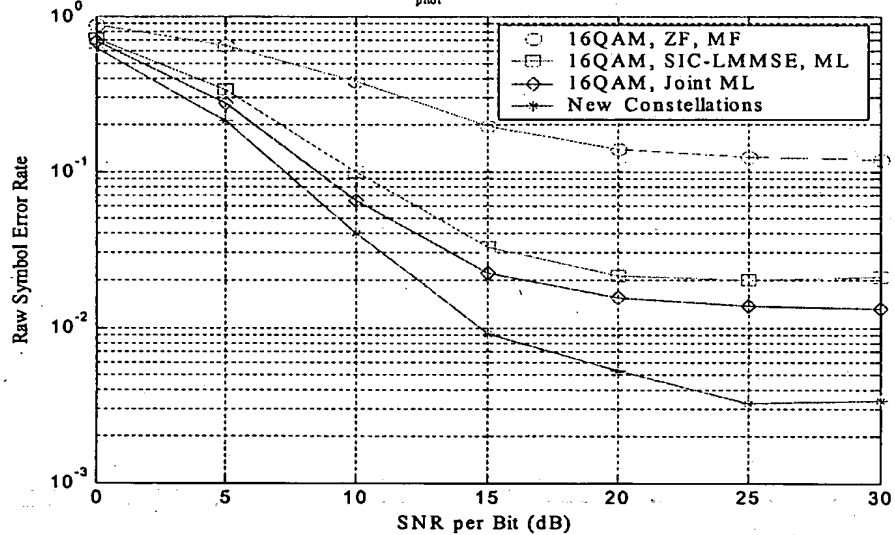


Figure 4B: Performance comparison between different conventional (BLAST-type) MIMO techniques and new constellations for a lightly loaded 2x2 MC-CDMA system with 128 sub-carriers, 8 pilots, and estimating 5 taps of the Vehicular A channel at 120 Km/h.

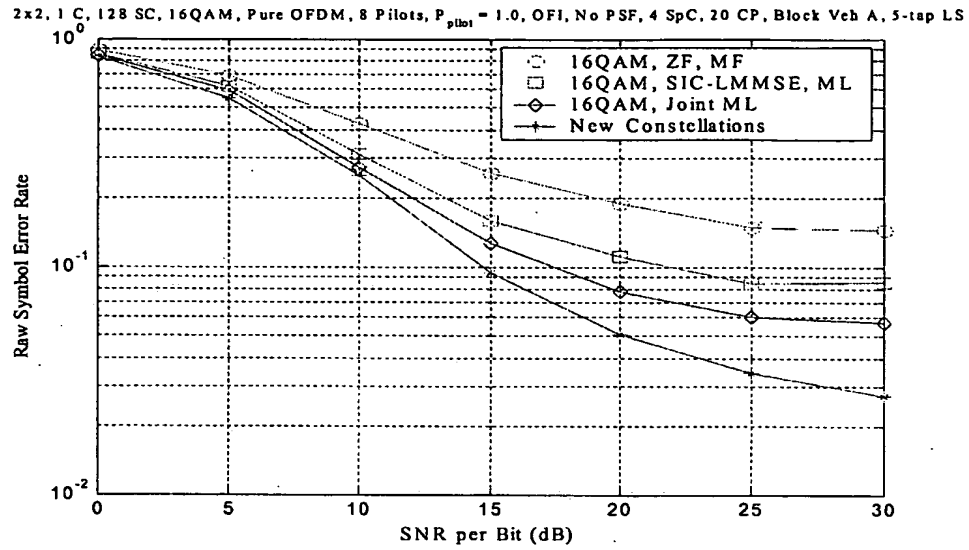


Figure 5A: Performance comparison between different conventional (BLAST-type) MIMO techniques and new constellations for a fully loaded 2x2 OFDM system with 128 sub-carriers, 8 pilots, and estimating 5 taps of the Block Vehicular A channel.

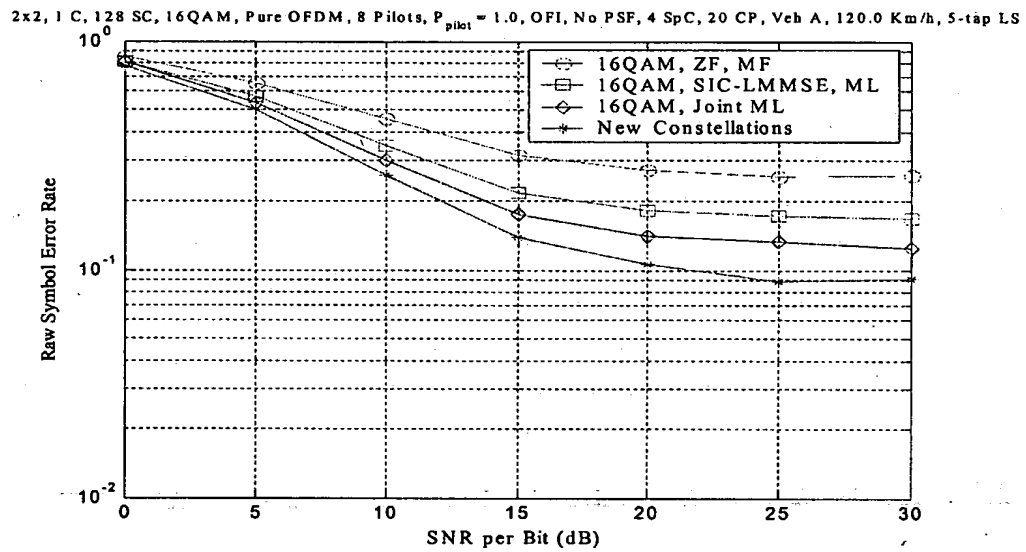


Figure 5B: Performance comparison between different conventional (BLAST-type) MIMO techniques and new constellations for a fully loaded 2x2 OFDM system with 128 sub-carriers, 8 pilots, and estimating 5 taps of the Vehicular A channel at 120 Km/h.